

Air to water heat pump Split Compact Type

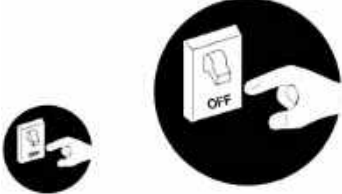
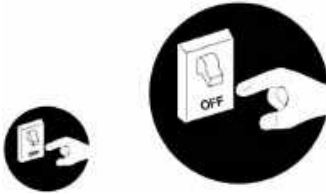






manual



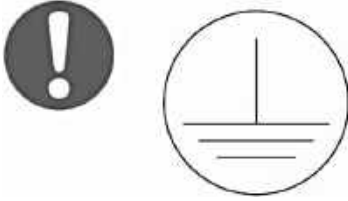
Before operation this product,
please read the instructions carefully and save this manual for future.

1 Safety precautions

1.1 Safety precautions

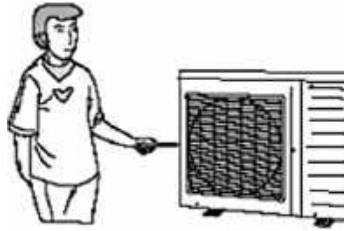
<p>Once abnormality like burning smell occurs, please cut off the power supply immediately and then contact with service center.</p>  <p>If the abnormality still exists, the unit may be damaged and electric shock or fire may result.</p>	<p>Be sure to pull out the power plug and drain the indoor unit and water tank when unit is not in use for a long time.</p>  <p>Otherwise, the accumulated dust may cause overheating fire or freeze of water tank or coaxial heater exchanger in winter.</p>	<p>Special circuit must be adopted for power supply to prevent fire.</p>  <p>Do not use octopus multipurpose plug or mobile terminal board for wire connection.</p>
<p>Before installation, please see if the voltage of local place accords with that on nameplate of unit and capacity of power supply, power cord or socket is suitable for input power of this unit.</p> 	<p>Don't operate the unit with wet hand.</p>  <p>Otherwise, it may cause electric shock.</p>	<p>Never damage the electric wire or use the one which is not specified.</p>  <p>Otherwise, it may cause Overheating or fire.</p>
<p>Before cleaning please cut off the power supply. Otherwise, it may cause electric shock or damage.</p> 	<p>The power supply must adopt special circuit with leakage switch and enough capacity. It is mandatory to use a suitable circuit-breaker for the heat pump and make sure the power supply to the heater corresponds to the specifications. Otherwise the unit might be damaged.</p> 	<p>User can not change power cord socket without prior consent. Wiring working must be done by professionals. Ensure good earthing and don't change earthing mode of unit.</p>

Earthing: the unit must be earthed reliably !
The earthing wire should connect with special device of buildings.



If not, please ask the qualified personnel to install.
Furthermore, don't connect earth wire to gas pipe, water pipe, drainage pipe or any other improper places which professional does not recognize.

Never insert any foreign matter into unit to avoid damage . And never insert your hands into the air outlet of outdoor unit.



Don't attempt to repair the unit by yourself.



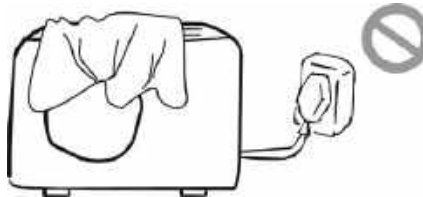
Improper repair may cause electric shock or fire, so you should contact the service center to repair.

Don't step on the top of the unit or place anything on it.



There is the danger of fall of things or people.

Never block the air inlet and outlet of unit.



It may reduce efficiency or cause stop of the unit and even fire.

Keep pressurized spray ,gas holder and so on away from the unit above 1m . It may cause fire or explosion.

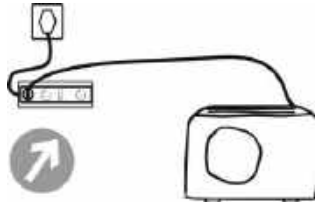


Please note whether the installation stand is firm enough or not.



If damaged, it may cause fall of the unit and injury of people.

Make sure to use a dedicated power line for the heat pump only. Do not add other appliances to the line.



Make sure no water or other liquid drips into the electric box of the unit Otherwise the unit might be damaged.



2 principle of a Heat Pump (refrigerant circuit) :

The refrigerant system consists of 5 main components: compressor, 4-way-valve, heat exchanger (condenser, refrigerant to water), electronic expansion valve, evaporator (air to refrigerant).

Heat pump can absorb the heating from air source. This makes the heat pump a very environmentally friendly and economically sound alternative for space heating.

* evaporator (air coil): low temperature, low pressure refrigerant go through evaporator to boil and turn from liquid to gas.

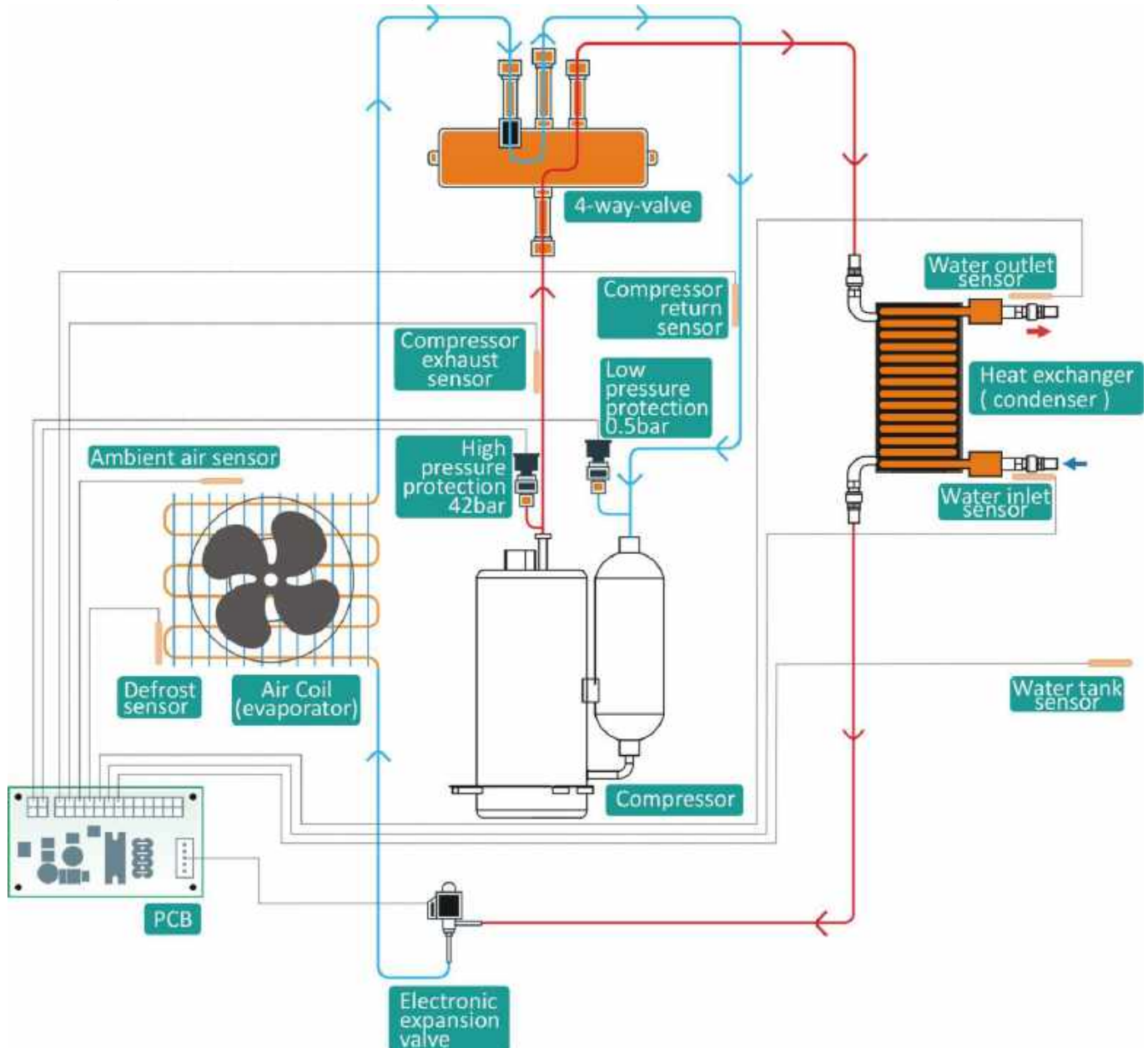
* compressor: compressor absorb refrigerant in gas status, and compress to high temperature, high pressure status.

* condenser (heat exchanger): refrigerant release heat energy to heat exchanger. refrigerant temperature reduce, and it return from gas to liquid status.

The heat energy is absorbed by water, circulated by a circulation pump to TANK or ROOM HEAT systems.

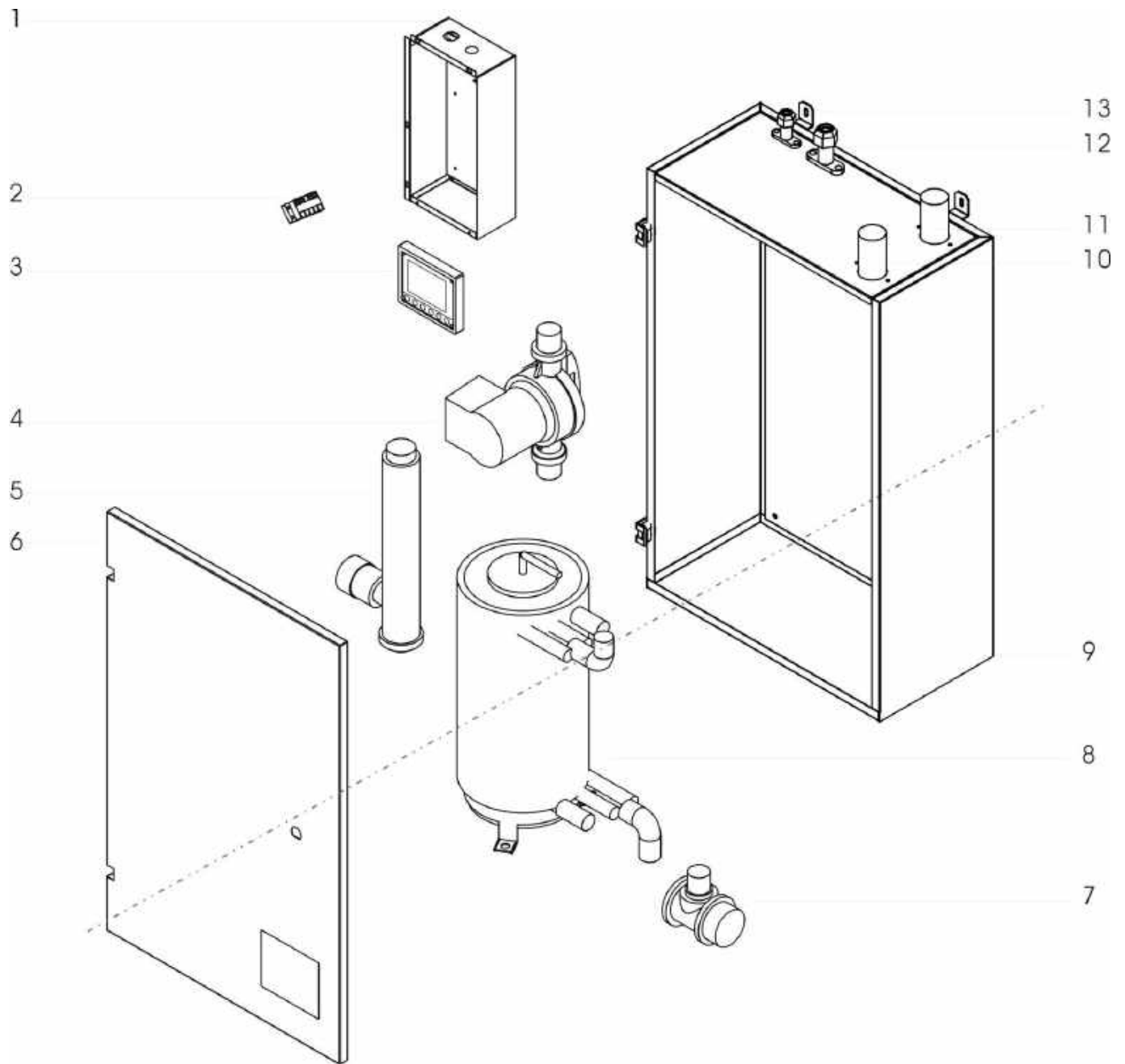
* EEV: refrigerant go through the electronic expansion valve, where its pressure is reduced.

Refrigerant system install 1 high pressure switch (42bar), 1 low pressure switch (0.5bar).



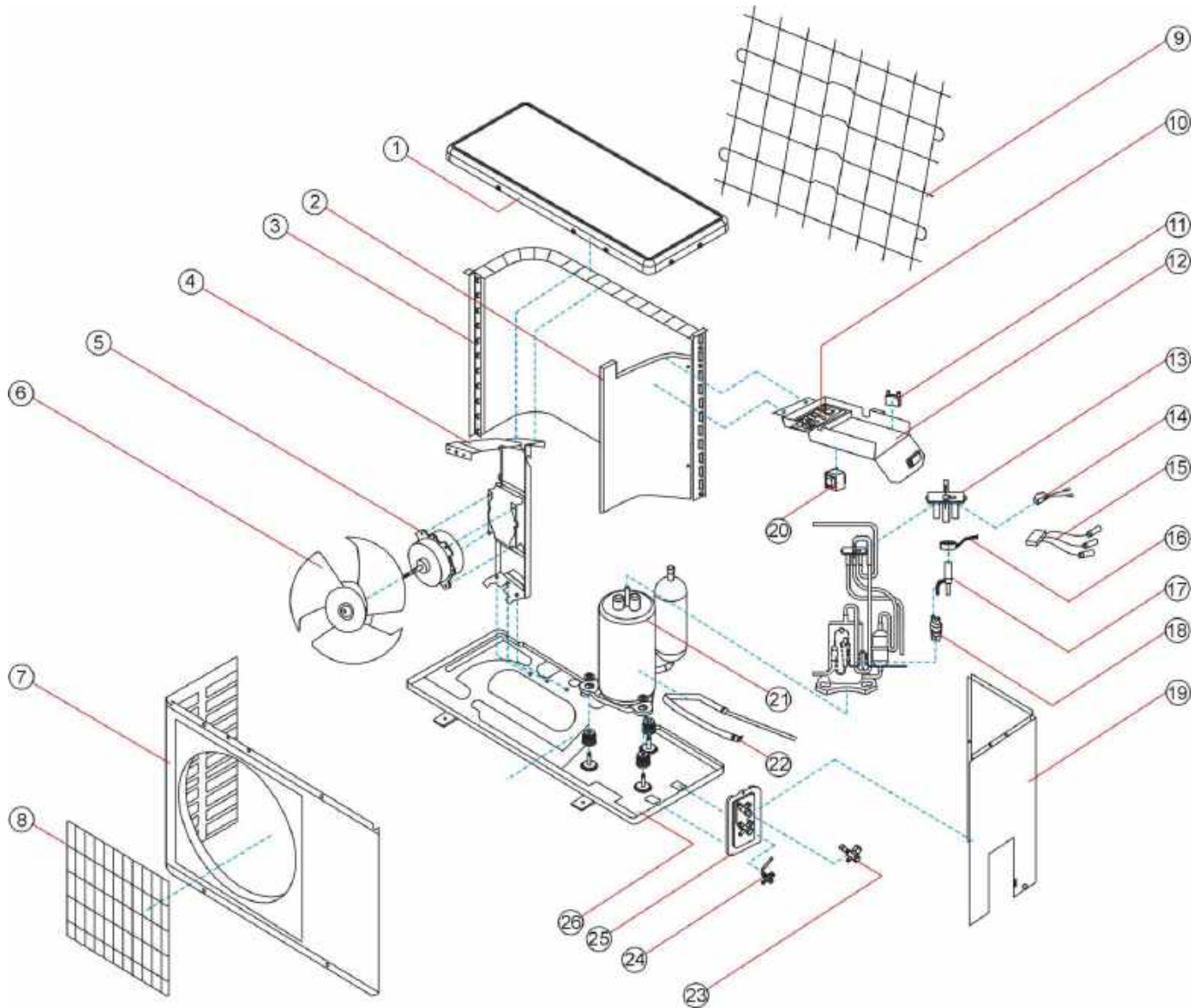
3 Explored view

3.1 indoor module explored view



1	Electronic control box	8	Shell-tube heat exchanger
2	Terminal	9	Indoor housing
3	Wire controller	10	Warm water connector to house heating
4	Circulation pump	11	Return water connector
5	Electrical heater	12	Gas valve
6	Front panel	13	Liquid valve
7	Water-flow-switch		

3.2 Outdoor unit explored view



1	Top panel	14	Electronic coil for 4-way-valve
2	Separate panel	15	Sensor
3	Evaporator	16	Coil for electronic expansion valve
4	Motor bracket	17	Electronic expansion valve
5	Motor	18	Filter
6	Fan blade	19	Right panel
7	Front panel	20	transformer
8	Front net	21	Compressor
9	Back net	22	Compressor heater
10	PCB	23	Gas connector
11	Motor capacitor	24	Liquid connector
12	Electrical control box	25	Valve plate
13	4-way-valve	26	Bottom plate

3.3 main components



compressor



Shell tube heat exchanger



evaporator



Pressure switch



Electronic expansion valve



4-way-valve



Wire controller



PCB



sensor



Electrical heater and holder



Circulation pump



Water flow switch



Fan blade



Motor

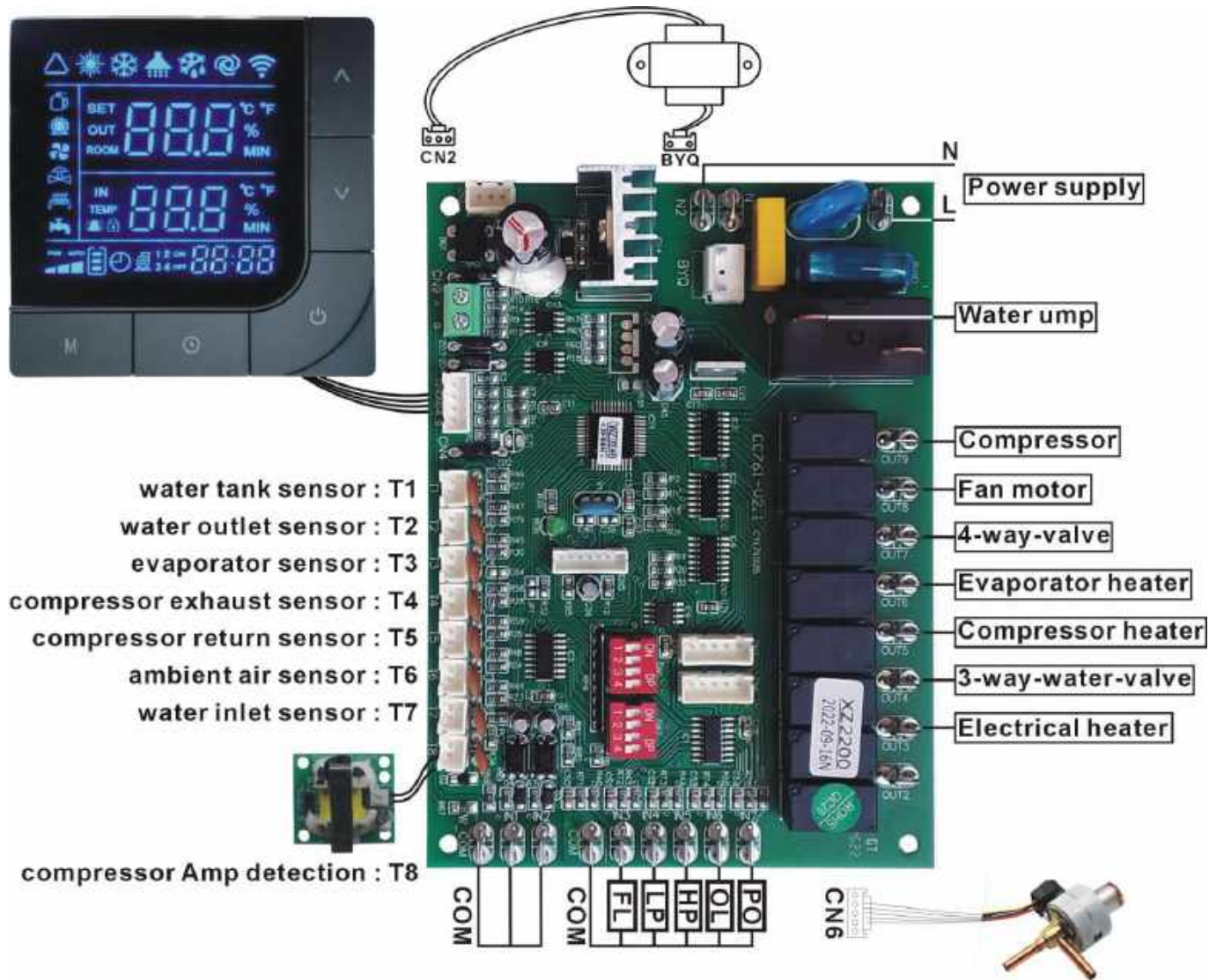


Compressor heater



Evaporator bottom heater

3.4 principle of Circuit board



water tank sensor : T1
 water outlet sensor : T2
 evaporator sensor : T3
 compressor exhaust sensor : T4
 compressor return sensor : T5
 ambient air sensor : T6
 water inlet sensor : T7

compressor Amp detection : T8



PO : phase order protection
 OL : COOL/HEAT on-line switch
 HP : high pressure protection
 LP : low pressure protection
 FL : water-flow protection

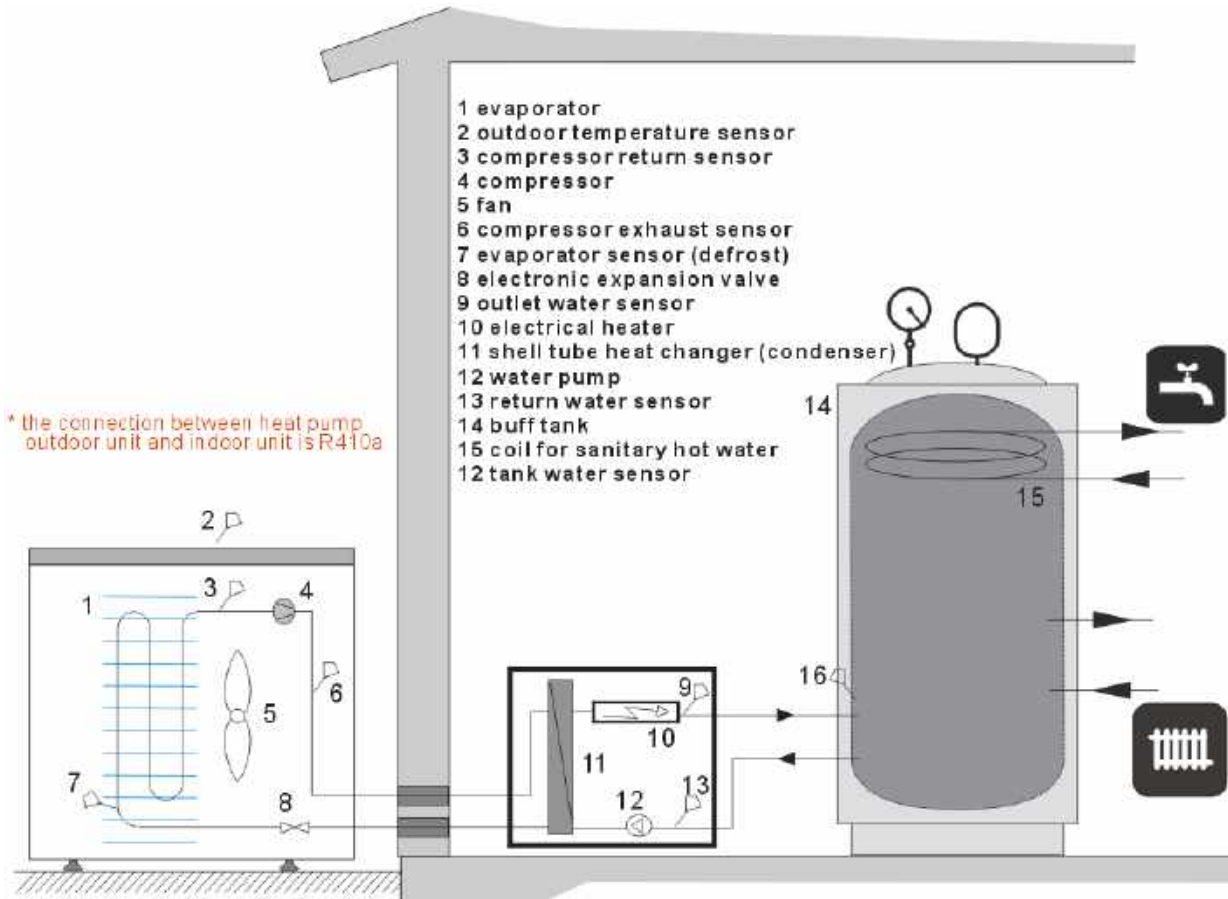
Sensor
 T1 : water tank sensor
 T2 : water outlet sensor
 T3 : evaporator sensor
 T4 : compressor exhaust sensor
 T5 : compressor return sensor
 T6 : ambient air sensor
 T7 : water inlet sensor
 T8 : compressor Amp detection

relay
 OUT3 : electrical heater
 OUT4 : 3-way-water-valve
 OUT5 : compressor heater
 OUT6 : evaporator heater
 OUT7 : 4-way-valve
 OUT8 : fan motor
 OUT9 : compressor
 RY1 : water pump

Error
 E01 Compressor exhaust sensor failure
 E05 Evaporator sensor failure
 E09 Compressor return sensor failure
 E17 User water return sensor failure
 E18 Water outlet sensor failure
 E19 Water inlet sensor failure
 E20 water tank sensor failure
 E21 Communication problem between controller & PCB
 E22 Ambient sensor
 E25 Water-level-switch protection
 P01 Water-flow-switch protection
 P02 High pressure protection
 P06 Low pressure protection
 P10 Phase-order protection
 P11 Compressor over-heat protection
 P15 Water temperature too big different between inlet & outlet water
 P16 Cooling too low protection
 P17 Anti-freeze protection in winter
 P19 Compressor current-limiting protection
 P23 Water outlet temperature too low

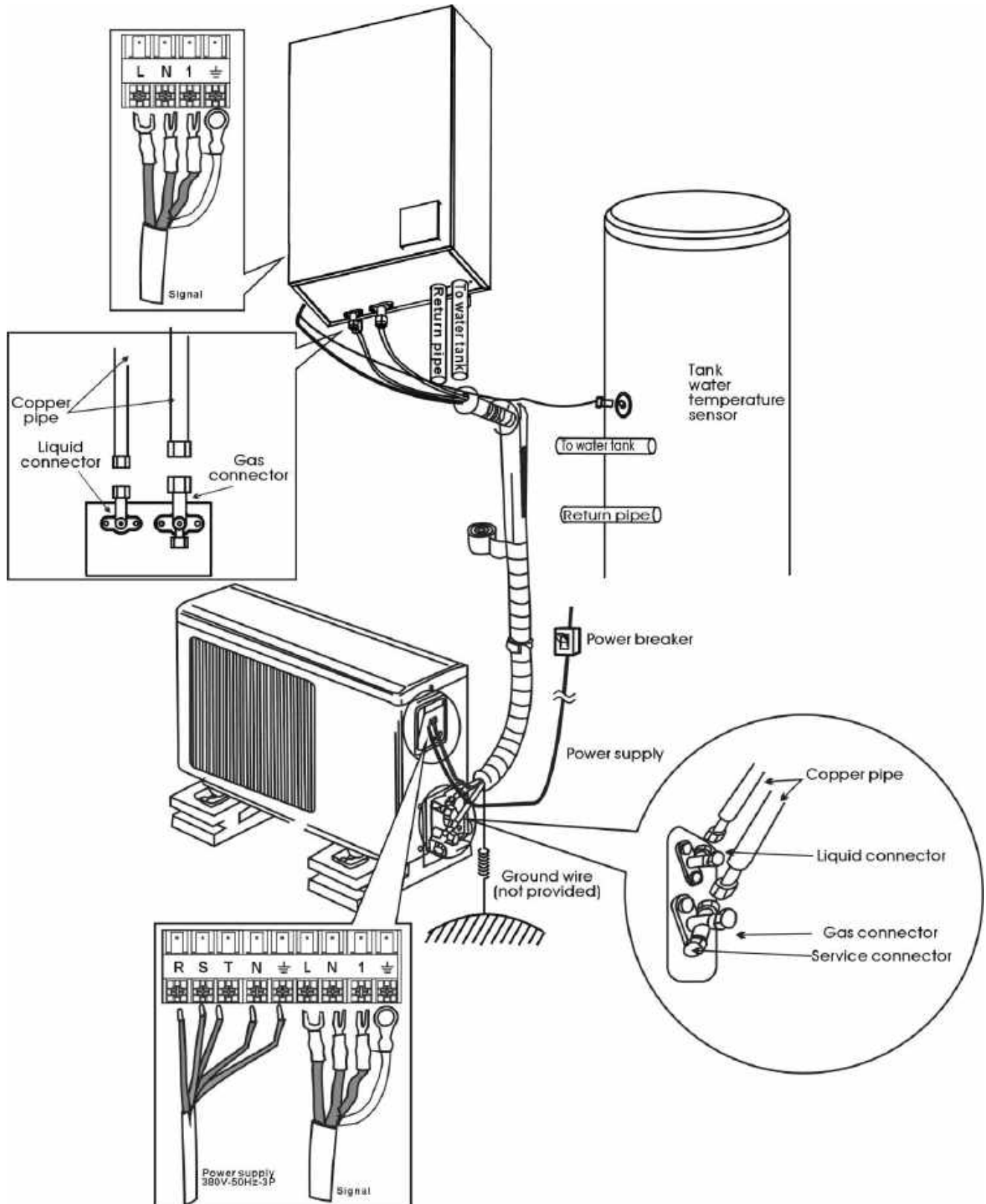
4. Applications

4.1 application: supply hot water / heating



5. Installation

5.1 installation plan



5.2 Installation Outdoor Unit

5.2.1 Select the Installation Place of Outdoor Unit

* The outdoor unit should be installed on a solid wall and fastened securely.

* The outdoor units should be installed close to the house, on a terrace, on the facade or in a garden. They are designed to operate in the rain but can also be installed under cover as long as there is sufficient ventilation. There should be no obstacles to hinder the free circulation of air to the exchanger inlet and outlet (see installation diagrams below).

* The emplacement of the outdoor unit should be carefully chosen and protected from prevailing winds in order for it to be compatible with environmental requirements: integration into the site, noise level.

* We particularly recommend:

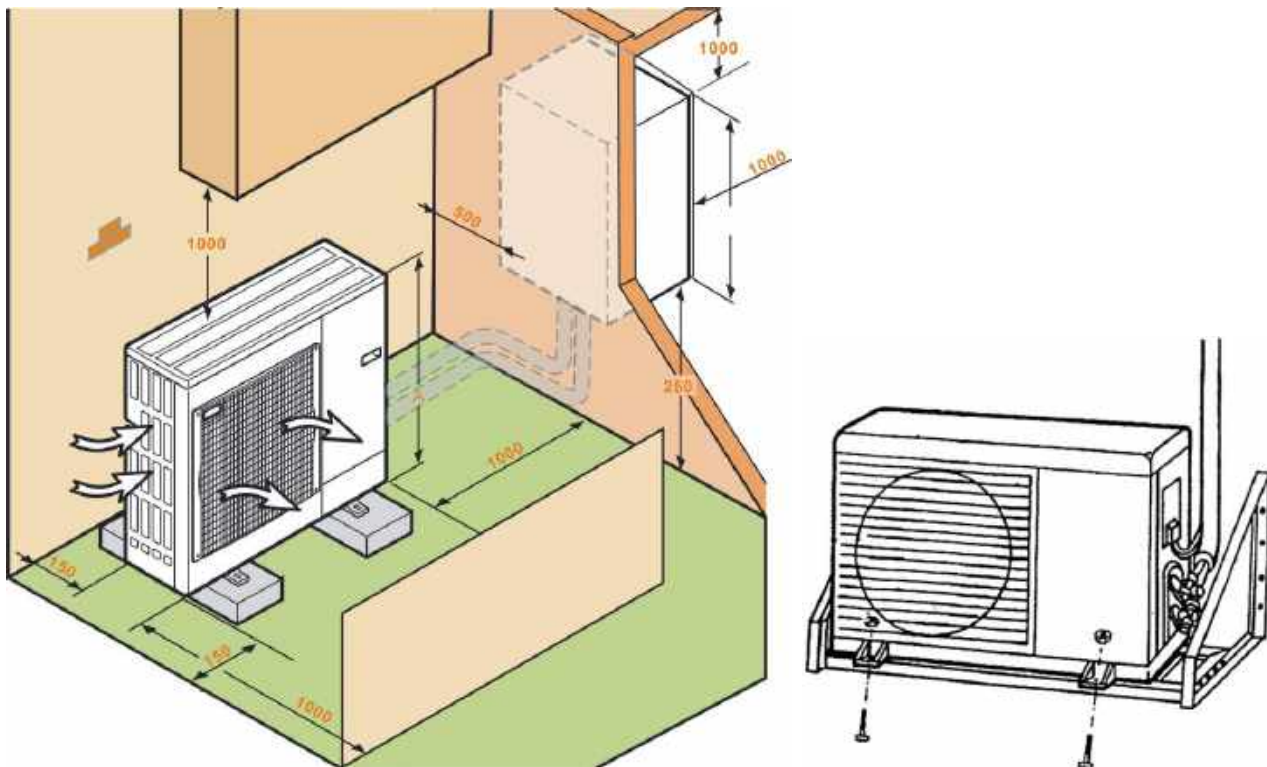
- Not placing the outdoor unit close to sleeping areas
- Not placing it opposite a glazed wall
- Avoiding proximity to a terrace

* we recommend positioning the unit above the average depth of snowfall in the region in which it is installed.

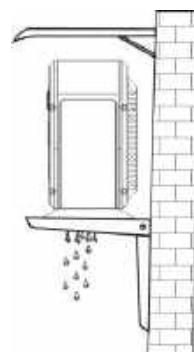
* It is necessary to provide clearance all around the appliance to carry out connection, commissioning and maintenance operations.

* The following procedure must be observed before connecting the pipes or electric cables.

- 1) decide which is the best position on the wall and leave enough space to be able to carry out maintenance easily.
- 2) fasten the outdoor unit support to the wall using screw anchors which are particularly suited to that type of wall.
- 3) use a larger quantity of screw anchors than normally required for the weight they have to bear: during operation the machine vibrates and has to remain fastened in the same position for years without the screws becoming loose.
- 4) mount the outdoor unit on the support using the four bolts supplied.



* Please install the drain connector to the unit when necessary. In some cold areas (temperature below 0), please don't use the drain connector, otherwise it may clogged by ice.

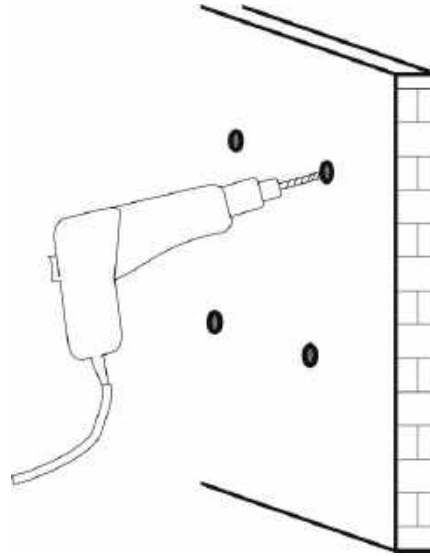


5.3 Indoor Unit Installation

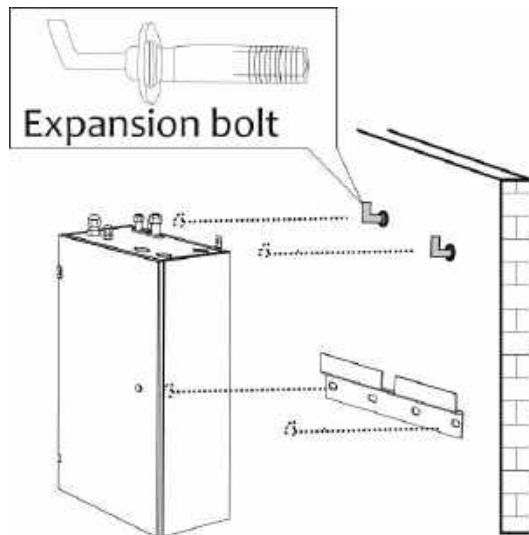
Note: The wall must strong enough to hang the unit on.

1. measure the location from indoor unit.

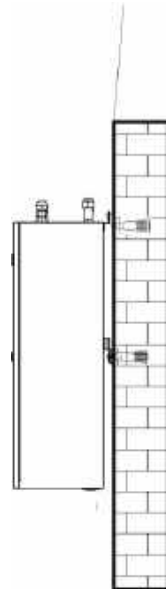
2. Drill the holes on the wall.



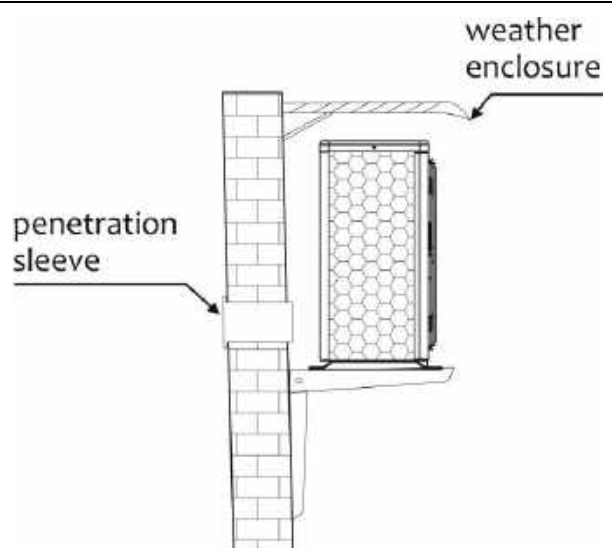
3. Insert the expansion bolts (Terminal diameter less than 16mm) into the holes.



4. Hang the indoor unit on the expansion bolts.



The refrigerant piping and signal cable between indoor&outdoor unit should go through the wall by using a wall sleeve.



5.4 Refrigeration Connection

5.4.1 Refrigeration connection

The commissioning of heat pump includes operations on the refrigeration circuit. Appliances must be installed, commissioned, maintained and repaired by qualified, authorized personnel, pursuant to the requirements of prevailing directives, laws and regulations and in accordance with the codes of practice of the profession.

* Before shipped out from manufacturer, the outdoor unit has been filled with refrigerant. Additional refrigerant may be filled when copper pipe is more than 5 meters.

* Check the liquid valve and the gas valve of the outdoor unit. The valves shall be completely shut off.

* the refrigerant connection are as following figure:

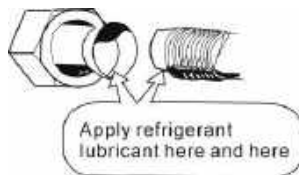
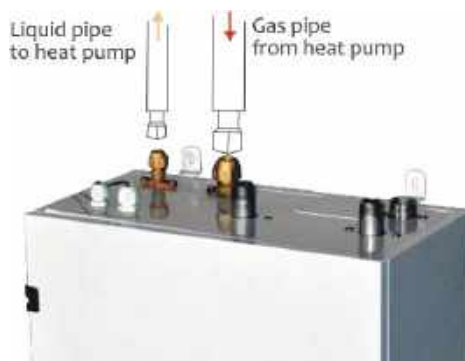
5.4.2 Maximum distances and quantity of refrigerant fluid to be loaded

	5kW	7kW	9kW	12kW	15kW	18kW
Ø gas pipe	1/2 "	5/8"	5/8"	3/4"	3/4"	3/4"
Ø liquid pipe	1/4 "	3/8"	3/8"	1/2"	1/2"	1/2"
max pipe length	20 m	20 m	20 m	20 m	20 m	20 m

IMPORTANT

The refrigerant R410a inside heat pump is suitable for 5 meter copper pipe. If the refrigerant link between outdoor unit and indoor unit is more than 5 meter, Please fill 10g per meter for 5kW, 7kW ; 30g per meter for 9kW,12kW, 15kW, 18kW.

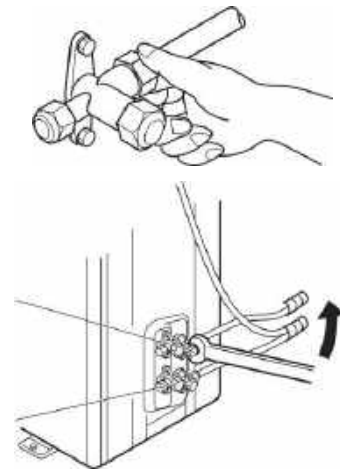
5.4.3 Refrigeration connection step



1. connect the copper pipe to indoor unit.

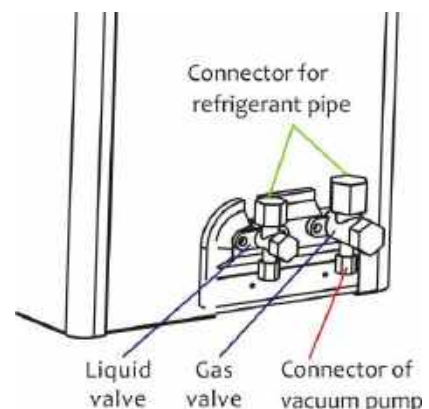


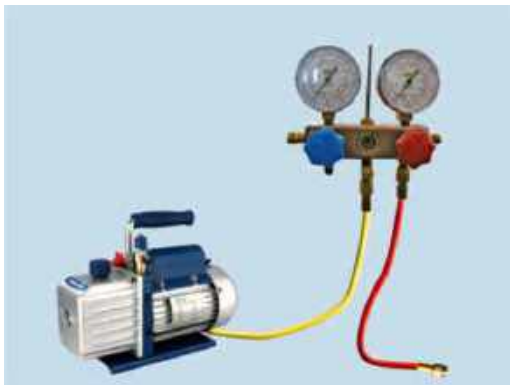
3. connect other side of copper pipe to outdoor unit



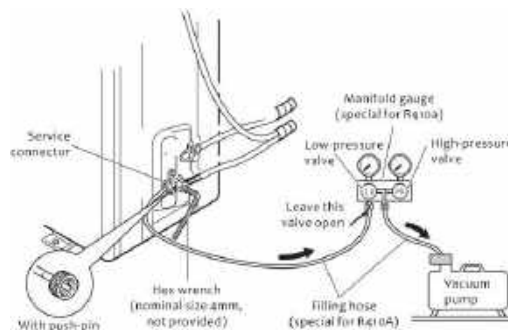
2. Wipe the quick connectors with clean cloth to prohibit dust and impurity entering the pipes.

Align the center of the pipe and fully screw in the angular nuts with Finger

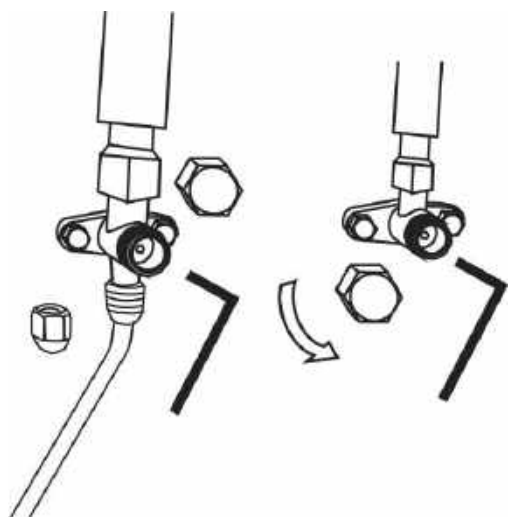




4. A vacuum pump and manifold gauge are needed. Connect the pressure gauge to the vacuum pump. Use Vacuum pump to remove the air from indoor unit and copper pipe.



5. When vacuuming the indoor unit and copper pipe, please do not turn on gas/liquid valve, otherwise refrigerant leakage. Vacuum the unit for at least 15 minutes till negative value shown on the pressure gauge, and close the manifold gauge.



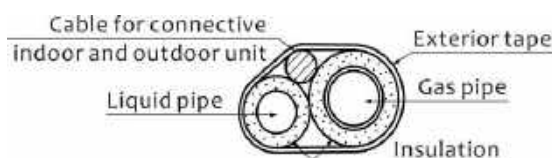
6. Use a 5mm hex wrench to open two valves

8. After confirming that there is no leakage from the system, when the compressor is not in operation, charge additional R410a refrigerant with specified amount to the unit through the service connector on liquid valve.

Be sure to charge the specified amount of refrigerant in liquid state to the liquid pipe. Since R410a is a mixed refrigerant, adding it in gas form may cause the refrigerant composition to change, preventing normal operation.



7. remove the service pipe of pressure gauge. Put copper nut back. Tighten them with a wrench. Connect the electric cable as per wiring diagram, and bundle it with the connecting pipe.



5.4.4 Return refrigeration

If heat pump want to disconnect. Please return refrigerant R410a from indoor unit back to outdoor unit as following :



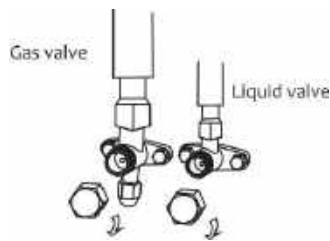
Hold button 5 seconds COOL mode.



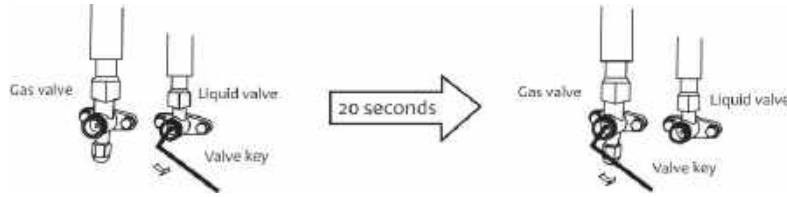
display.


4-way-valve ON, water pump switch ON, compressor start after check water-flow, fan start,

1. Remove the cap of two valves with the spanner.

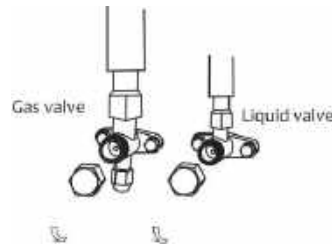


2. Tighten the core of the liquid valve (the smaller one) with valve key at first. After about 20 seconds, you can hear a special sound from compressor; tighten the core of the gas (the bigger one) with valve key.

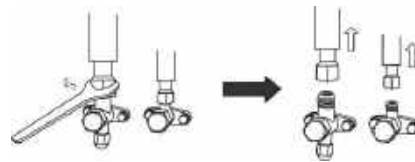


3. Press  to turn off the heat pump and exit the return refrigerant mode. heat pump stop.

4. Tighten the cap of two valves.



5. Loose the nut of the connect pipe to the outdoor unit valve with 2 spanner, disconnect the connect pipe and the two valves.



5.5 Electrical connection

IMPORTANT

The electrical installation of heat pumps must be done in accordance with the local and national Codes of Practice and pursuant to prevailing standards, decrees and subsequent texts. The cable will be carefully chosen according to the following information: maximum amperage on the outdoor unit (thermodynamic unit). See the table below, distance of the appliance from the original power supply, upstream protection, neutral operating conditions.

1.It is recommended to use a suitable breaker for the heat pump and make sure the power supply to the heater corresponds to the specifications. Otherwise the unit might be damaged.

2.The power supply to the heat pump unit must be grounded.

3.Cable should be fixed tightly, to ensure it won't get loosen.

5.6 Hydraulic connection

5.6.1 General

Pipe installation must be carried out in accordance with current norms and directives. Heat pump can operate with a return temperature of up to 50°C and and outgoing temperature from the unit of 55°C.

Heat pump is not equipped with shut off valves ; these must be installed outside the heat pump to facilitate any future servicing.

Heat pump can be connected to the radiator system, floor heating system and/or fan coil units.

Install the safety valve and manometer.

Indoor module is equipped with circulation pump, water-flow-switch, 3-way-water-vave.

Note : this heat pump is split type with refrigeration link between outdoor unit and indoor module, it is not necessary to add glycol to the installation.

Buffer tank :

The installation of buffer tank is recommended for installations.

It is intended :

- increase the water volume in an installation in order to limit the short-cycle operation of the compressor. The greater the water volume, the lower the number of start-ups of the compressor and the longer its useful life.
- Guarantee on energy reserve for the defrosting phases.

5.6.2 Filling and venting the heating medium system

1. Check the water system for leakage.
2. Connect the filling pump and return line on the heating system's service connections as shown in figure.
3. Close the valve between the service connections.
4. Open the valves on the service connections(AV1,AV2).
5. Pushing the white manual lever down to bottom. (this has already been done when the machine leaves factory), then three way valve's water tank port is closed (the "B" port), room heat port is open (the "A" port).
6. Start the filling pump, and fill until there is fluid in the return pipe.
7. Open up Power ON from control panel to start machine, then heat medium water pump is running, the valve will return to the up position when power is restored.
8. Firmly pushing the white manual lever down to midway and in. in this position both the 'A' and 'B' ports are open.
9. The filling pump and the heating medium pump are now operational. The fluid should circulate via the container with tap water until it emerges from the return hose without being mixed with air.
10. Stop machine, heat medium water pump stop running. Depressing the white manual lever lightly and then pulling the lever out, pushing the while manual lever down to bottom position, and then "A" port open, "B" port is closed.
11. Stop the filling pump and clean the particle filter.
12. Start the filling pump, open the valve between the service connections.
13. Close the valve on the service connection's return line. Now pressurize the system (to max 3 bar)with the filling pump.
14. Close the valve (AV2) on the service connection.
15. Stop the filling pump.
16. Select the auto operating mode using the operating mode button.



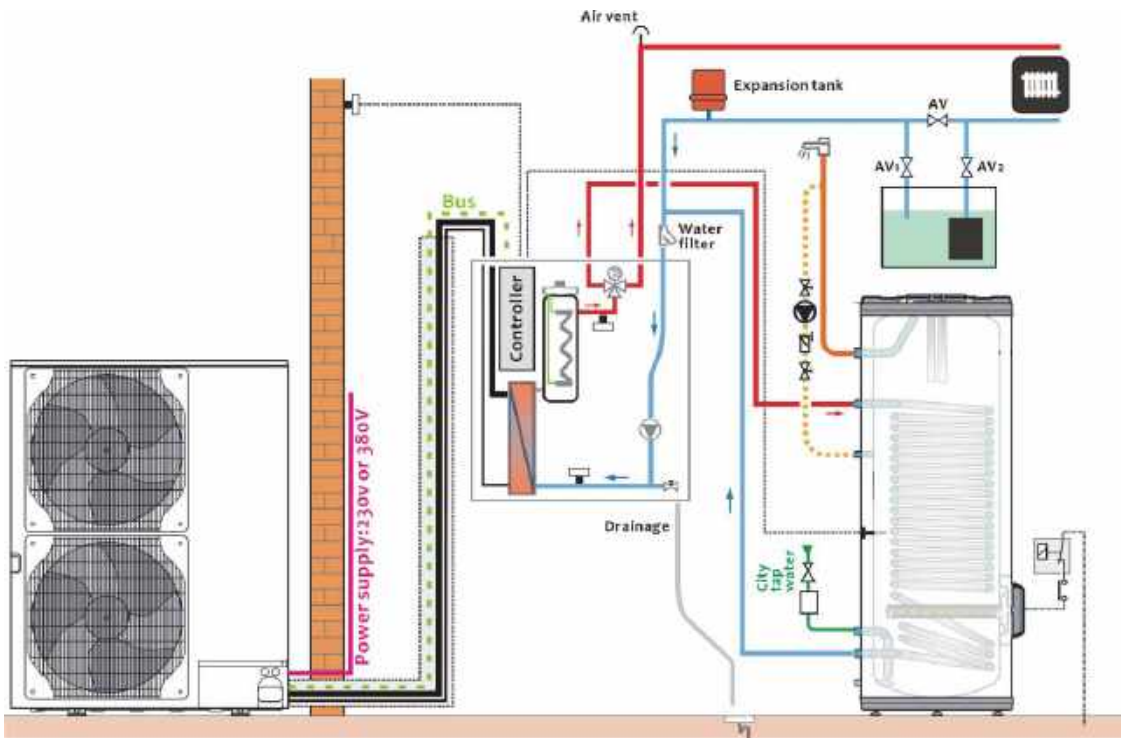
Push the white gear onto the position of middle, and then use your thumb to press it inside, this time both port A and port B are in open state.



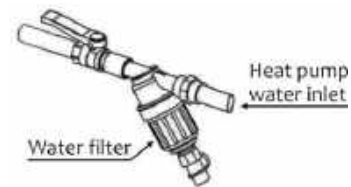
Please use screwdriver to unclench the white gear of the three way valve.



Then the white gear will move back to the original position. The three way valve will turn to port B automatically.



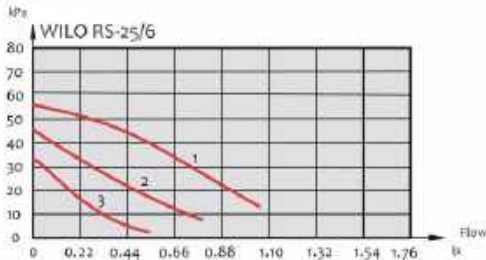
A mesh filter must be installed in front of the water inlet of the unit and water tank, for keeping the water quality and collecting impurity contained in the water. Take care to keep the water filter mesh towards the bottom. Check valve is recommended to be installed at both sides of the filter, so as to clean or change the filter in a easier way.



5.6.3 Circulation pump capacity diagram on heating medium side

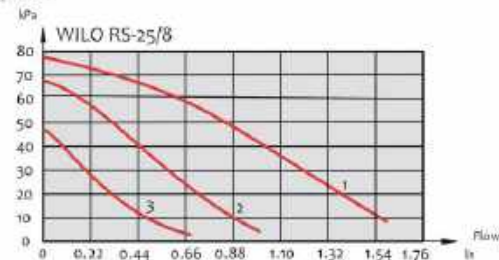
5kW, 7kW

Available pressure:



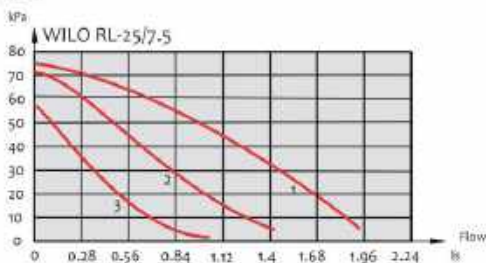
9kW, 12kW

Available pressure:



15kW, 18kW




















Available pressure:



6 Control panel



6.1 description of display panel



 AUTO mode	 HEAT mode
 COOL mode	 DHW mode (sanitary hot water)
 defrost mode	 ECO mode (energy conservation)
 WIFI	 compressor symbol
 water pump symbol	 fan motor symbol
 electrical heater symbol	 key lock
 4 sets TIMER ON/OFF	 clock
  increase, reduce button	 ON/OFF button 1) In keylock, hold 5s to release keylock 2) hold 1s to ON/OFF unit 3) in setting, press it to return main interface
 TIMER button Hold 5s to clock setting Press it TIMER ON/OFF	 function button 1) press it to view running state 2) hold 3s to parameter setting


6.2 Key Lock function








When  light ON, hold  button 5 seconds to release key lock.
If do not press any button 30 seconds, controller will lock key.

6.3 ON/OFF unit



hold  button 1 second to start unit



 is DHW mode
 is tank water temperature
 is ambient air temperature
 is water level (*invalid for current unit*)
 is current clock

6.4 Mode select



is HOTWATER mode



is tank water temperature



is ambient air temperature



means compressor is running



means water pump is running



means fan motor is running



Hold button 5 seconds to next mode



is HEAT mode:



is water inlet temperature



is ambient air temperature



Hold button 5 seconds to next mode



is AUTO mode:



is water inlet temperature



is ambient air temperature



Hold button 5 seconds to next mode



is HEAT + HOTWATER mode:












is tank water temperature



is inlet water temperature







6.5 Clock setting











- Hold  button 5 seconds to interface of CLOCK setting.
- Press  button,  hour flash.
- Press   button to adjust hour.
- Press  button again,  minute flash.
- Press   button to adjust minute.

6.6 TIMER setting












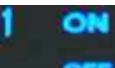


- press  button to interface of TIMER 1,  flash.
- Press   button to TIMER 1,2,3,4 backwater valve,   flash. (backwater valve invalid)



- press  button to TIMER 1 ON hour,  hour flash.
- Press   button to change TIMER 1 ON hour
- press  to TIMER 1 ON minute,  minute flash.
- Press   button to change TIMER 1 ON minute





- press  to TIMER 1 OFF hour,  hour flash.
- Press   button to change TIMER 1 OFF hour.
- press  to TIMER 1 OFF minute,  minute flash.
- Press   button to change TIMER 1 OFF minute

- press  button to exist edit.  flash. TIMER 1 confirm.
- Hold  button 5 seconds to cancel TIMER 1, only  flash.



6.7 setpoint adjust




press  or  button to interface of setpoint adjust



L5 is parameter for setpoint of DHW










press  or  button to increase or reduce setpoint

6.8 running state

press  button to view running statue

o 1	Tank sensor
o 2	Inlet sensor
o 3	Outlet sensor
o 4	Ambient sensor
o 5	<i>Backwater sensor (invalid)</i>
A 1	Compressor exhaust sensor
A 2	evaporator sensor
A 3	Compressor return sensor
A 4	Compressor Amp
A 5	EEV opening



6.9 User parameter setting



	<p>Hold  button 3s to interface of parameter setting.</p> <p>Press  button to edit parameter,  flash.</p> <p>press  or  button to increase or reduce parameter.</p> <p>Press  button again to exist edit.</p> <p>press  or  button to next or previous parameter.</p> <p>press  button : exist to main interface</p>
--	---


P	Description
L0	temperature difference to start compressor for HEAT/COOL mode
L1	Setpoint for HEAT mode
L2	Setpoint for COOL mode
L3	Setpoint for AUTO mode
L4	temperature difference to start compressor for DHW mode
L5	Setpoint for DHW mode
L6	HEAT ECO scheme 0 : heat curve / 1 : Variable setpoint by TIME
L7	Translation setting for heat curve, range 0~30, default 10
L8	Slope setting for heat curve, range 24~50, default 30
L9	first period TIME, default 23
L10	Second period TIME, default 6
L11	Third period TIME, default 9
L12	Fourth period TIME, default 17
L13	Setpoint for first period, default 35°C
L14	Setpoint for second period, default 42°C
L15	Setpoint for Third period, default 30°C
L16	Setpoint for fourth period, default 40°C
L17	Electrical heater use 0: cancel / 1: for HOTWATER / 2: for HEAT / 3: for HOTWATER + HEAT
L18	Permissible ambient temperature to electrical heater ON
L19	Delay time for electrical heater ON
L20	Region for defrost 0: wet / 1: dry
L21	Ambient point for region dry
L22	<i>Difference for solar pump ON (invalid)</i>
L23	<i>Setpoint for backwater (invalid)</i>
L24	<i>Allowable filling water temperature (invalid)</i>
L25	Setting compressor Amp [0~40A] 0 is do not detect
L26	Defrost cycle
L27	Evaporator temperature for defrost start
L28	Defrost max running time



L29	Evaporator temperature for defrost exit
L30	Temperature difference between ambient & evaporator
L31	Water pump selection when electrical heater ON 0 OFF / 1 ON
L32	Water pump selection in COOL/HEAT/AUTO 0 constant temperature OFF / 1 constant temperature ON
L33	Water-flow-switch selection for Module 0 (independent)/1 (shared)
L34	<i>Module centralized control scheme (invalid)</i>
L35	<i>Module regulation cycle (invalid)</i>
L36	Ambient temperature to water pump ON -30°C ~ -1°C
L37	Test of water pump 0 OFF / 1 ON default 0
L38	Test of backwater pump 0 OFF / 1 ON default 0
L39	Test of 3-way-water-valve 0 OFF / 1 ON default 0


6.10 Factory parameter setting



Hold   button 3s to password interface.



Press  button to change switch the password bit.


press  or  button to increase or reduce value.
Password : 0814



Press  button to confirm password.


In factory interface of factory parameter setting:

Press  button to edit parameter,  flash.

press  or  button to increase or reduce parameter.

Press  button again to exist edit.



press  or  button to next or previous parameter.

press  button : exist to main interface

P	Description
H0	Min. Ambient temperature
H1	Mode 0: DHW 1: C/H/AUTO 2: DWH/H 3: all mode 4: HEAT 5: COOL 6: DHW/C
H2	Setpoint for compressor over-heat protection
P	Difference temperature for EEV exhaust control
P0	cycle of EEV action
P1	DHW/HEAT target superheat
P2	EEV min opening when ambient $\geq 17^{\circ}\text{C}$
P3	Allowable exhaust temperature during EEV regulation
P4	EEV opening in defrost
P5	Min EEV opening When $5^{\circ}\text{C} \leq \text{ambient temperature} < 17^{\circ}\text{C}$
P6	Min EEV opening When $-2^{\circ}\text{C} \leq \text{ambient temperature} < 5^{\circ}\text{C}$
P7	Min EEV opening When $-9^{\circ}\text{C} \leq \text{ambient temperature} < -2^{\circ}\text{C}$
P8	EEV selection in HEAT 0: manual / 1: auto
P9	<i>Reserve</i>
PA	EEV max opening
Pb	Min EEV opening When ambient temperature $< -9^{\circ}\text{C}$
F0	Max setpoint in DHW/HEAT
F1	Deviation between display temperature & tank sensor, inlet sensor
F2	<i>Setting exhaust temperature to Liquid injection solenoid valve ON (invalid)</i>
F3	<i>Setting difference of liquid injection solenoid valve (invalid)</i>
F4	<i>ambient temperature to enthalpy solenoid valve ON (invalid)</i>
F5	<i>Reserve</i>
U0~Ub	Manual EEV opening in HEAT
Y0~y8	Manual EEV opening in COOL

6.11 Mode

6.11.1 ECO mode, display

Hold   button 5 seconds to activate/cancel ECO mode.

6.11.2 DHW mode: display (with parameter H1: 1, 2, 3, 4)

Water pump, fan motor, compressor ON. 3-way-water-valve, 4-way-water switch OFF.
Compressor stop/start by TANK water sensor.

L4	temperature difference to start compressor for DHW mode
L5	Setpoint for DHW mode
F1	Deviation between display temperature & tank sensor, inlet sensor

Normal scheme : do not select

Tank sensor \geq parameter **L5**, constant temperature unit stop.
Tank sensor \leq parameter **L5** - parameter **L4**, then unit start.

ECO scheme :  **select**

Setpoint adjusted by ambient air sensor:


Ambient temperature	Setpoint HOTWATER
ambient < 25°C	Parameter L5
25°C ≤ ambient ≤ 28°C	51°C - parameter F1
29°C ≤ ambient ≤ 32°C	49°C - parameter F1
Ambient > 32°C	47°C - parameter F1

6.11.3 HEAT mode:  **display** (With IN6 (on-line-switch) CLOSE, parameter H1: 3, 6)

Water pump, fan motor, compressor, 3-way-water-valve switch ON.

Compressor stop/start by inlet sensor.

L0	temperature difference to start compressor for HEAT/COOL mode
L1	Setpoint for HEAT mode
L6	HEAT ECO scheme 0 : heat curve / 1 : Variable setpoint by TIME
L7	Translation setting for heat curve, range 0~30, default 10
L8	Slope setting for heat curve, range 24~50, default 30
F0	Max setpoint in DHW/HEAT

Normal scheme :  **do not select**

Inlet sensor ≥ parameter **L1**, then constant temperature unit stop.

Inlet sensor ≤ parameter **L1** - parameter **L0**, then unit start.

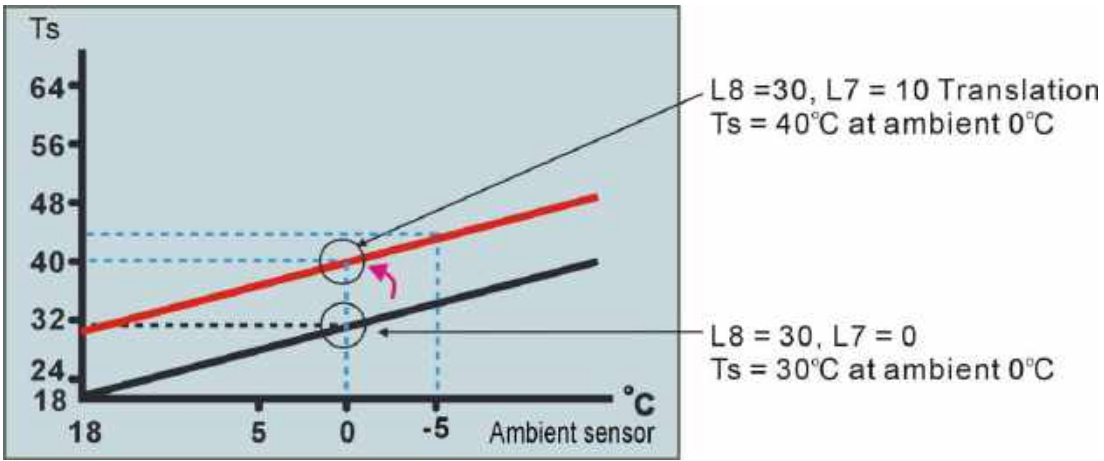
ECO scheme :  **select**

6.11.3.1 parameter L6 = 0 (ECO scheme : heat curve)

Tour : ambient air temperature

Min setpoint is 18°C, max setpoint is parameter **F0**

$$\text{Calculated setpoint } T_s = \frac{(L8-18) * (18-T_{out})}{18} + 18 + L7$$



6.11.3.2 parameter L6 = 1 (ECO scheme : Variable setpoint by TIME)

L9	first period TIME, default 23
L10	Second period TIME, default 6
L11	Third period TIME, default 9
L12	Fourth period TIME, default 17
L13	Setpoint for first period, default 35°C
L14	Setpoint for second period, default 42°C
L15	Setpoint for Third period, default 30°C
L16	Setpoint for fourth period, default 40°C

Setpoint will adjust by below table:

TIME 23:00 ~ 6:00	TIME 6:00 ~ 9:00	TIME 9:00 ~ 17:00	TIME 17:00 ~ 23:00
Setpoint = 35°C (L13)	Setpoint = 42°C (L14)	Setpoint = 30°C (L15)	Setpoint = 40°C (L16)

6.11.4 COOL mode: display

With IN6 (on-line-switch) CLOSE, parameter H1: 1, 3, 5

Water pump, fan motor, compressor, 4-way-valve, 3-way-water-valve switch ON

Compressor stop/start by inlet sensor

L0	temperature difference to start compressor for ROOM HEAT/COOL mode
L2	Setpoint for ROOM COOL mode

Normal scheme : do not select

Inlet sensor \leq parameter L2, then constant temperature unit stop.

Inlet sensor \geq parameter L2 + parameter L0, then unit start.

ECO scheme : select

Setpoint adjusted by ambient air sensor:

Ambient temperature	Ambient > 30°C	30°C \geq ambient \geq 25°C	ambient \leq 25°C
Setpoint COOL	8°C	10°C	12°C

Other are similar as normal scheme.

6.11.5 DHW/COOL mode: display

With IN6 (on-line-switch) CLOSE, parameter H1: 3, 6

HOTWATER Priority. When DWH constant temperature unit stop, then COOL run.

6.11.6 DHW/HEAT mode: display

With IN6 (on-line-switch) CLOSE, parameter H1: 2, 3

HOTWATER Priority. When DHW constant temperature unit stop, then HEAT run.

6.11.7 AUTO mode: display (without ECO function)

With IN6 (on-line-switch) CLOSE, parameter H1: 1, 3

L0	temperature difference to start compressor for HEAT/COOL mode
L3	Setpoint for AUTO mode

Inlet sensor \leq parameter **L3** - parameter **L0**, then run at HEAT mode.

Inlet sensor \geq parameter **L3** + parameter **L0**, then run at COOL mode.

Inlet sensor = parameter **L3** , then constant temperature unit stop.

6.12 electronic expansion valve (EEV)

P	Difference temperature for EEV exhaust control
P0	cycle of EEV action
P1	HOWATER/HEAT target superheat
P2	EEV min opening when ambient $\geq 17^{\circ}\text{C}$
P3	Allowable exhaust temperature during EEV regulation
P4	EEV opening in defrost
P5	Min EEV opening When $5^{\circ}\text{C} \leq$ ambient temperature $< 17^{\circ}\text{C}$
P6	Min EEV opening When $-2^{\circ}\text{C} \leq$ ambient temperature $< 5^{\circ}\text{C}$
P7	Min EEV opening When $-9^{\circ}\text{C} \leq$ ambient temperature $< -2^{\circ}\text{C}$
P8	EEV selection in HEAT 0: manual / 1: auto
PA	EEV max opening
Pb	Min EEV opening When ambient temperature $< -9^{\circ}\text{C}$

Initial opening 350

2. After unit power on, EEV rest, 1st opening to 550, 2nd to min opening, then to initial 350.

6.12.1 EEV control in DHW/HEAT mode

When unit start 2 minutes, EEV opening adjust to fixed step * 2 (see below fixed step table)

When unit start 2 to 5 minutes, EEV opening adjust to fixed step (see below fixed step table)

ambient tank/inlet	$T \leq -5$	$-5 < T \leq 3$	$3 < T \leq 10$	$10 < T \leq 18$	$18 < T \leq 25$	$T > 25$
$< 47^{\circ}\text{C}$	U0(10*10P)	U1(15*10P)	U2(20*10P)	U3(25*10P)	U4(30*10P)	U5(35*10P)
$\geq 47^{\circ}\text{C}$	U6(15*10P)	U7(20*10P)	U8(25*10P)	U9(30*10P)	Ua(35*10P)	Ub(40*10P)

When unit start 5 minutes, EEV opening control normally

(P8=0 manual by above table, P8=1 AUTO by below logic)

Compressor exhaust temperature : TD

Compressor return temperature : TS

Evaporator temperature : TC

When $TD \geq P3$, enter EEV opening controlled by Allowable exhaust temperature, opening increase 20 step each time.

When $P3 - P < TD < P3$, then keep current opening.

When $TD \leq P3 - P$, return to EEV superheat control, opening by below calculation.

Calculation of EEV opening (max step per EEV action cycle limit to $\pm 20\text{P}$):

EEV Opening change $\nabla P =$ coefficient $KP * ($ actual average superheat **SH**average $- P1)$

$P = P$ (initial opening) $+ \nabla P$;

When $SH \leq -1$, $KP=3$;

When $-1 < SH \leq 0$, $KP=2$;

When $SH > 0$, $KP=1$;

SH: calculated value of superheat, $SH = TS - TC$;

SHaverage: average value of actual superheat within 30s, sampling every 5s;

Parameter **P1**: HOWATER/HEAT target superheat;

P: EEV actual opening.

P0 : cycle of EEV action, 20 second

6.12.2 EEV control in COOL mode

EEV control by fixed opening

ambient inlet	$T \leq 28$	$28 < T \leq 38$	$38 < T$
≤ 17	y1(25*10P)	y1(40*10P)	y2(48*10P)
$17 < T \leq 35$	y3(30*10P)	y4(40*10P)	y5(48*10P)
$T > 35$	y6(35*10P)	y7(45*10P)	y8(48*10P)

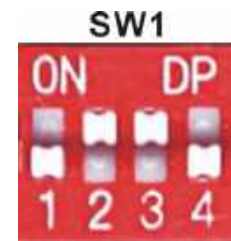
6.12.3 EEV control in defrost

EEV fixed opening 400P (parameter P4)

6.13 evaporator heater (SW1-2 set ON):

When ambient $< 8^{\circ}\text{C}$ & compressor run, then evaporator heater switch ON.

When ambient $> 8^{\circ}\text{C}$, then evaporator heater switch OFF.



6.14 compressor heater (SW1-3 set ON):

When ambient $< 8^{\circ}\text{C}$ & compressor stop, then compressor heater switch ON.

When ambient $> 8^{\circ}\text{C}$ or compressor start, then compressor heater switch OFF.

6.14 defrost :

L17	Electrical heater use 0: cancel / 1: for HOTWATER / 2: for HEAT / 3: for HOTWATER + HEAT
L20	Region for defrost 0: wet / 1: dry
L21	Ambient point for region dry
L26	Defrost cycle
L27	Evaporator temperature for defrost start
L28	Defrost max running time
L29	Evaporator temperature for defrost exit
L30	Temperature difference between ambient & evaporator

6.14.1 L20 = 0 wet region :

Defrost enter condition:

Compressor running time \geq L26, and Evaporator sensor \leq L27

6.14.2 L20 = 1 dry region :

Defrost enter condition:

When ambient temperature > L21,

then condition : Compressor running time \geq L26, and Evaporator sensor \leq L27

When ambient temperature \leq L21, then condition Simultaneously satisfy ABC or ABD:

A. ambient sensor \leq L21

B. evaporator sensor \leq L27

C. compressor running time $\geq 2 * L26$

D. ambient sensor - evaporator sensor \geq L30, and compressor running time \geq L26

6.14.3 defrost start action :

Compressor, fan motor stop

Water pump continue running

3-way-water-valve keep previous statue

Electrical heater forced switch ON in HOWATER defrost if L17 = 1

Electrical heater forced switch ON in HEAT defrost if L17 = 2

Electrical heater forced switch ON if L17 = 3

55 second, 4-way-valve ON

60 second, compressor ON

6.14.4 defrost exit condition :

Evaporator sensor \geq L29, or defrost running time \geq L28.

Outlet sensor $\leq 5^{\circ}\text{C}$, then Exit defrost immediately.

If big difference between inlet & outlet sensor, then Exit defrost immediately.

6.14.5 defrost exist action :

Compressor stop, fan motor run.

55 second, 4-way-valve OFF.

60 second, compressor ON.

Electrical heater reset to previous statue.

6.15 four-way-valve:

4-way-valve switch OFF at DHW/HEAT mode, switch ON at defrost/COOL mode.

6.16 three-way-water-valve (optional):

3-way-water-valve switch ON at COOL/HEAT/AUTO mode, switch OFF at DHW.

3-way-water-valve keep previous state in defrost.

6.17 water pump:

L32	Water pump selection in COOL/HEAT/AUTO 0 constant temperature OFF / 1 constant temperature ON
L36	Ambient temperature to water pump ON $-30^{\circ}\text{C} \sim -1^{\circ}\text{C}$
L37	Test of water pump 0 OFF / 1 ON

Water pump switch ON 60 seconds before compressor start.

Water pump continue running 30 seconds after compressor stop.

When controller OFF statue, adjust L37 = 1 to switch ON water pump for Pipeline emptying.

When controller OFF statue, ambient \leq L36, then water pump keep ON, 3-way-water-valve ON;
When unit start or ambient \geq L36 + 2°C, then exist water pump keep ON function.

In COOL/HEAT/AUTO mode constant temperature unit stop, water pump stop/run by L32.
In HOWATER mode mode constant temperature unit stop, water pump stop.

6.18 fan motor

Fan motor run 5 seconds before compressor start.

When unit stop, fan motor & compressor stop at the same time.

Fan motor stop in defrost.

6.19 electrical heater:

L17	Electrical heater use 0: cancel / 1: for HOTWATER / 2: for HEAT / 3: for HOTWATER + HEAT
L19	Delay time for electrical heater ON
L18	Permissible ambient temperature to electrical heater ON
L31	Water pump selection when electrical heater ON 0 OFF / 1 ON

Electrical heater forcedly switch ON in defrost.

6.19.1 Parameter 17 = 0, cancel electrical heater

6.19.2 Parameter 17 = 1, electrical heater for DHW mode

electrical heater ON when meet all following conditions:

- * overheat thermostat CLOSE
- * Demand for hot water
- * if parameter L31 = 1, water pump switch ON 30 seconds in advance, water-flow-switch CLOSE
- * electrical heater ON delay time \geq parameter L19
- * Ambient temperature \leq parameter L18

electrical heater OFF when meet any following condition:

- * overheat thermostat OPEN
- * no demand for hot water
- * if parameter L31 = 1, water-flow-switch OPEN
- * Ambient temperature $>$ parameter L18 + 2°C

6.19.3 Parameter 17 = 3, electrical heater for DHW/HEAT mode

electrical heater ON when meet all following conditions:

- * overheat thermostat CLOSE
- * Demand for HEAT
- * if parameter L31 = 1, water pump switch ON 30 seconds in advance, water-flow-switch CLOSE
- * electrical heater ON delay time \geq parameter L19
- * Ambient temperature \leq parameter L18

electrical heater OFF when meet any following condition:

- * overheat thermostat OPEN
- * no demand for hot water
- * if parameter L31 = 1, water-flow-switch OPEN
- * Ambient temperature > parameter L18 + 2°C

6.19.4 Parameter 17 = 2, electrical heater for HEAT mode

electrical heater ON when meet all following conditions:

- * overheat thermostat CLOSE
- * Demand for HEAT
- * if parameter L31 = 1, water pump switch ON 30 seconds in advance, water-flow-switch CLOSE
- * electrical heater ON delay time ≥ parameter L19
- * Ambient temperature ≤ parameter L18

electrical heater OFF when meet any following condition:

- * overheat thermostat OPEN
- * no demand for hot water
- * if parameter L31 = 1, water-flow-switch OPEN
- * Ambient temperature > parameter L18 + 2°C

6.20 display temperature correction:

F1	Deviation between display temperature & tank sensor, inlet sensor
----	---

When parameter F1 = 0, no correction function for tank (inlet) temperature display

When parameter F1 is not set to 0, tank (inlet) temperature display = tank (inlet) + parameter F2

6.21 separate testing

L37	Test of water pump	0 OFF / 1 ON	default 0
L38	Test of backwater pump	0 OFF / 1 ON	default 0
L39	Test of 3-way-water-valve	0 OFF / 1 ON	default 0

Above 3 parameters only adjust in shutdown state. When unit use, please adjust 3 parameters to 0, so as not to affect the normal control.

6.22 error code

E01	Compressor exhaust sensor failure	P02	High pressure protection
E05	Evaporator sensor failure	P06	Low pressure protection
E09	Compressor return sensor failure	P10	Phase-order protection
E17	User water return sensor failure	P11	Compressor over-heat protection
E18	Water outlet sensor failure	P15	Water tempe. too big between inlet & outlet water
E19	Water inlet sensor failure	P16	Cooling too low protection
E20	TANK WATER sensor failure	P17	Anti-freeze protection in winter
E21	Communication problem (controller&PCB)	P18	Electrical heater over-heat protection
E22	Ambient sensor	P19	Compressor current-limiting protection
E25	Water-level-switch protection	P23	Water outlet temperature too low in defrost
P01	Water-flow-switch protection	P24	Fan motor over-heat protection

6.23 water flow protection P01

water pump run 15 seconds, if water flow switch continue OPEN for 5 seconds, then PCB judge as water flow fault. compressor and fan motor do not start. Water pump switch OFF after 10 seconds. Controller displays error code P01.

If water pump fails for consecutive 3 times, water pump will not be started. When water flow switch is detected to be closed, it will resume operation.

In shutdown state, when parameter L37 (water pump test) set to 1 (on), water pump operates, and the water flow protection is shielded at this time.

6.24 high pressure protection P02

compressor start 5 seconds, if high pressure switch continue OPEN for 5 seconds, then PCB judge as high pressure protection. Controller displays error code P02 and stop compressor. Compressor will restart 3 minutes later.

Within 30 minutes, 3 times of high pressure protection, unit needs to be powered on again to resume operation.

High pressure protection do not affect the operation of electric heater.

6.25 low pressure protection P06

compressor start 5 seconds, if low pressure switch continue OPEN for 5 seconds, then PCB judge as low pressure protection. Controller displays error code P06 and stop compressor. Compressor will restart 3 minutes later.

Within 30 minutes, 3 times of low pressure protection, unit needs to be powered on again to resume operation.

Low pressure protection do not affect the operation of electric heater.

6.26 compressor over-heat protection P11

H2	Setpoint for compressor over-heat protection
----	--

Compressor is running,if compressor exhaust temperature \geq parameter H2, unit stop, controller display P11. 3 minutes later, exhaust temperature is \leq H2 - 20°C, unit restart.

Within 30 minutes, 3 times of compressor over-heat protection, unit needs to be powered on again to resume operation.

6.27 excessive inlet & outlet temperature difference protection P15

In COOL/defrost operation, inlet temperature - outlet temperature is \geq 13°C, compressor stop, water pump continue running, controller display error code P15. Compressor will restart 3 minutes later.

Within 30 minutes, 3 times of excessive inlet and outlet water temperature difference protection, whole unit stop, unit needs to be powered on again to resume operation.

6.28 over-cool protection P16

In COOL mode, compressor run 5 minutes, if outlet temperature $\leq 5^{\circ}\text{C}$, then PCB judge as over-cool protection, controller display P16, compressor and motor stop, water pump continue running.

When outlet temperature $\geq 7^{\circ}\text{C}$, exit protection.

Within 30 minutes, 3 times of over-cool protection, whole unit stop, unit needs to be powered on again to resume operation.

6.29 Anti freezing function P17

When $2^{\circ}\text{C} < \text{outlet temperature} \leq 4^{\circ}\text{C}$, and ambient temperature $\leq 1^{\circ}\text{C}$, water pump run.

When outlet temperature is $\geq 6^{\circ}\text{C}$, or ambient temperature $> 2^{\circ}\text{C}$, water pump stop.

When outlet temperature $\leq 2^{\circ}\text{C}$ and ambient temperature is $\leq 1^{\circ}\text{C}$, whole unit will automatically run at HEAT mode.

When outlet temperature $\geq 20^{\circ}\text{C}$, or ambient temperature $> 2^{\circ}\text{C}$, unit stop.

6.30 WiFi configure

the internet access module install at controller.

Controller connect to server by your current WIFI.

Install controller where can access your current WIFI.

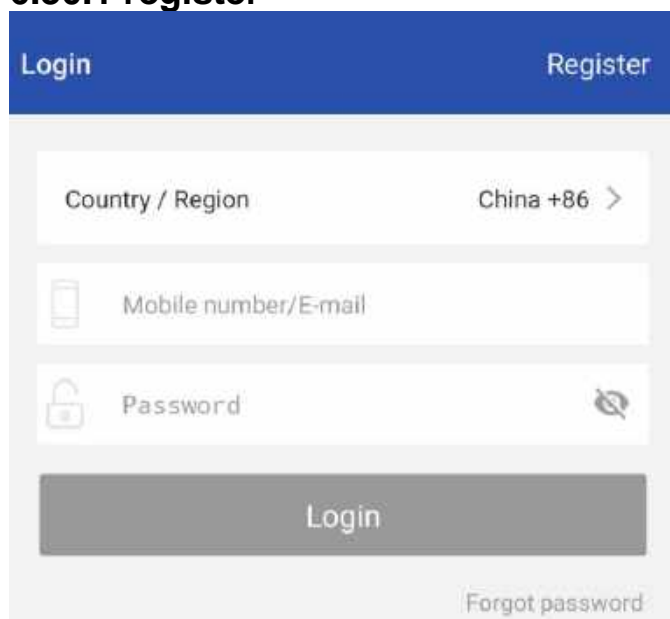
You have to put your Mobile and controller at same place during installation.



Multi-Machine

Multi-Machine will request GPS location at your mobile.

6.30.1 register

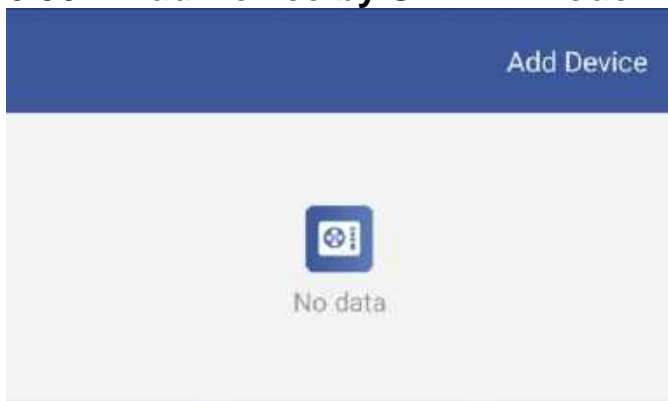


Click **Register** button

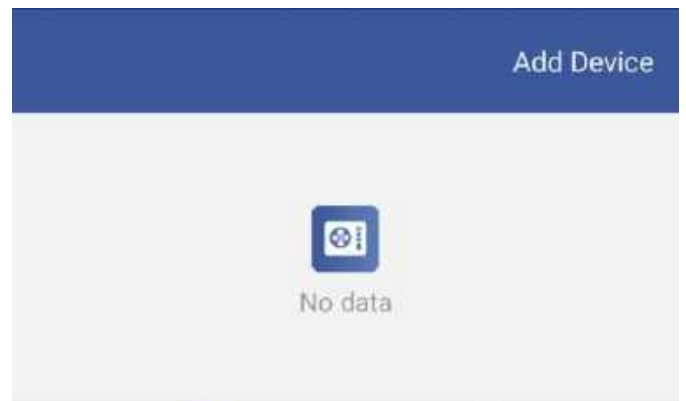


Input your Mobile Number

6.30.2 Add Device by SMART mode



Click **Add Device** button





Click **Add Device** button

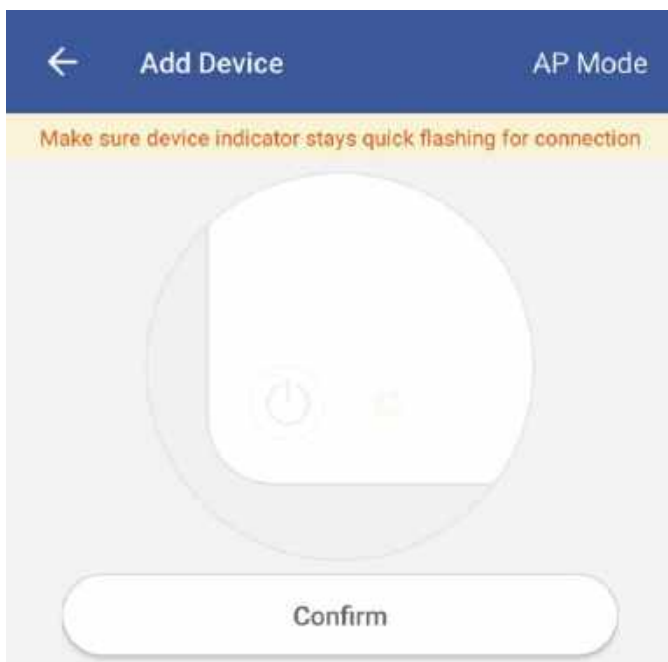


Click **CONNECT DEVICE** button



Hold   button 6 seconds to SMART network mode.

 quick flash



Click Confirm button



Input password of your current WIFI network



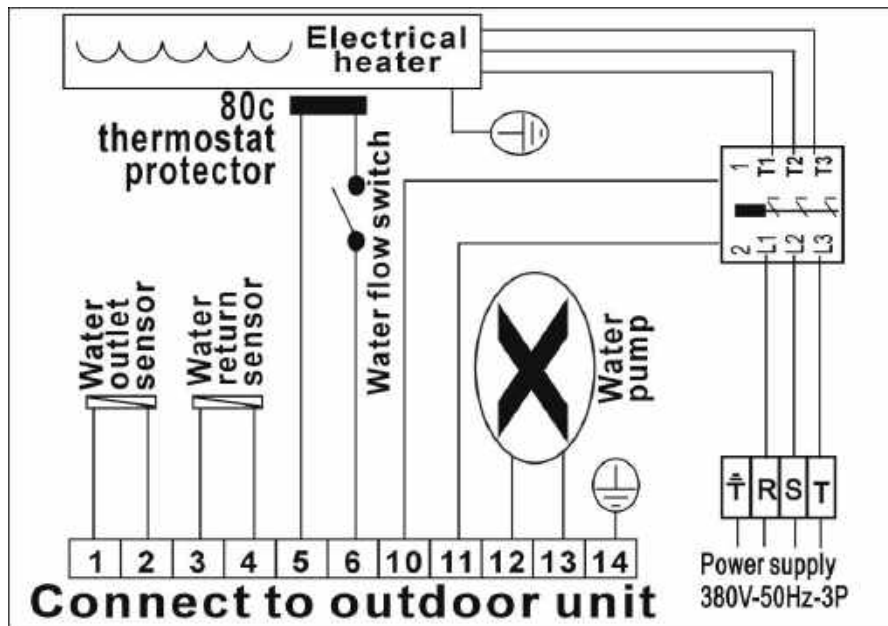
Click Heat_pump button

6.30.3 App wifi control

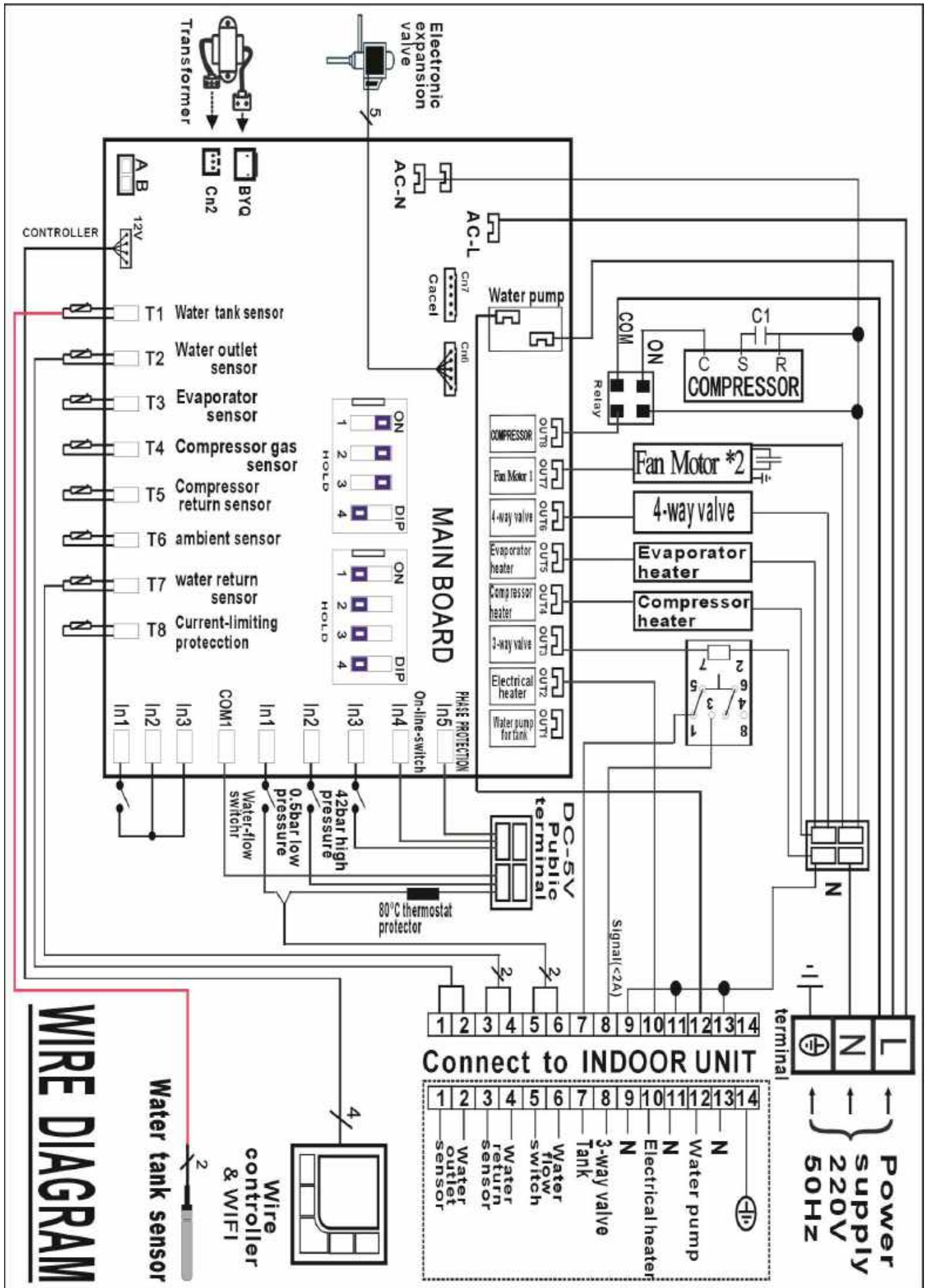


7. Wiring diagram:

* Indoor wiring diagram for three phase



* Outdoor wiring diagram for single phase



* Outdoor wiring diagram for three phase

